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RESOURCE UPDATE FS-53

FORESTS OF South Carolina, 2014

This resource update provides an overview of forest resources in South Carolina. Information for this factsheet was updated by means of the Forest Inventory and Analysis (FIA) annualized sample design. Each year 20 percent of the sample plots (one panel) in South Carolina are measured by field crews, the data compiled, and new estimates produced. After 5 years of measurements, the full sample (a cycle) is complete and a new survey cycle begins. The most reliable trend information (especially that concerning magnitude of change) comes from comparing two full cycles of data. Estimates presented here are for the measurement year 2014, with comparisons made to 2011. Generally speaking, for the 2014 inventory, estimates for variables such as area and volume are based on 3,580 plots measured between January 2010 and December 2014. Growth, removals, and mortality estimates for the 2014 inventory are based on plots measured between 2004 and 2009, and remeasured between 2010 and 2014.

This update is based on data processed and posted on the FIA database (FIADB) on June 11, 2015 (http://fia.fs.fed.us/tools-data/). Definitions can be found in the FIADB user's manual at http://fia.fs.fed.us/tools-data/docs/default.asp. Additional information can be found in the report South Carolina's Forests, 2006 (RB-SRS-158) (http://treesearch.fs.fed.us/pubs/33449).

Overview

Overall, area of forest land in South Carolina declined slightly between 2011 and 2014 (table 1). Number of live trees on forest land decreased by 4.1 percent between 2011 and 2014, from 10.1 billion to 9.7 billion. Volume increased by 5.6 percent, from 24.1 billion cubic feet to 25.5 billion cubic feet. There was a 0.5-percent increase in growth, a 0.9-percent decrease in annual removals, and a 12.8-percent increase in annual mortality.

Table 1—South Carolina forest statistics, change between 2011 and 2014

Forest statistics	2011 Estimate	Sampling error (percent)	2014 Estimate	Sampling error (percent)	Change since 2011 (percent)
Forest land					
Area *(thousand acres)*	13,120.5	0.76	12,974.1	0.70	-1.12
Number of live trees ≥1.0 inch d.b.h. *(million trees)*	10,110.8	1.79	9,694.9	1.66	-4.11
Net volume of live trees ≥5.0 inches d.b.h. *(million cubic feet)*	24,123.2	1.61	25,485.0	1.52	5.65
Live-tree aboveground biomass *(thousand oven-dry tons)*	597,846.3	1.45	624,719.4	1.35	4.49
Net growth of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	1,289.5	1.92	1,296.4	1.93	0.54
Annual removals of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	834.0	5.52	826.6	5.30	-0.88
Annual mortality of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	171.3	4.46	193.1	4.77	12.76
Timberland					
Area (thousand acres)	12,941.5	0.80	12,799.5	0.74	-1.10
Number of live trees ≥1.0 inch d.b.h. *(million trees)*	10,010.2	1.82	9,592.5	1.69	-4.17
Net volume of live trees ≥5.0 inches d.b.h. *(million cubic feet)*	23,624.2	1.64	24,973.1	1.53	5.71
Live-tree aboveground biomass *(thousand oven-dry tons)*	585,952.6	1.48	612,523.6	1.37	4.53
Net growth of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	1,286.9	1.96	1,291.1	1.94	0.33
Annual removals of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	837.5	5.51	828.4	5.30	-1.08
Annual mortality of live trees ≥5.0 inches d.b.h. *(million cubic feet per year)*	168.9	4.50	191.0	4.81	13.04

Forest Area

Total land area of South Carolina was 19.4 million acres, not including census water. Of this, 13.0 million acres (67 percent) was forested in 2014, a decrease of 1.1 percent from 2011 (table 1). South Carolina is divided into three survey units (fig. 1). Each of the three units was between 65 percent and 69 percent forested. There were small decreases in forest land in all three survey units (table 2).

Across the State, approximately 88 percent of the forest land in South Carolina is privately owned, a number that has remained consistent over the years. One noticeable change in ownership in South Carolina has been that of forest industry-owned land. In 2001, forest industry owned just over 2.0 million acres of timberland (Harper and Rominger 2013). Between 2011 and 2014, that number dropped by 59 percent, from a little over 336,000 acres of timberland to 137,400 acres. This continues a trend going back many years in the State as well as in the South.

The loblolly-shortleaf pine forest-type group occupied the largest proportion of forest land in South Carolina at 5.6 million acres. Between 2011 and 2014 the area of loblolly-shortleaf pine increased by almost 2 percent. The next most predominate forest-type group was oak-hickory, at 2.8 million acres.

Forest land in South Carolina is maturing (figs. 2 and 3). Area of stands <16 years old have declined by 34 percent since 2001, while stands 21 to 35 years old have increased by 86 percent (fig. 2). This is primarily a reflection of the aging of stands that were planted in the 1980s and early 1990s as part of the Conservation Reserve Program and as part of post-Hurricane Hugo recovery efforts. In addition, area of large-diameter sized stands has been increasing, while that of medium- and small-diameter stands has been decreasing. Large-diameter stands now account for 53 percent of the forest land in South Carolina. Since 2001, forest land area in large-diameter stands increased by 25 percent. This is in contrast to decreases in large-diameter stands between 1986 and 2001, partially due to Hurricane Hugo related mortality of large-diameter trees (Conner and others 2004).

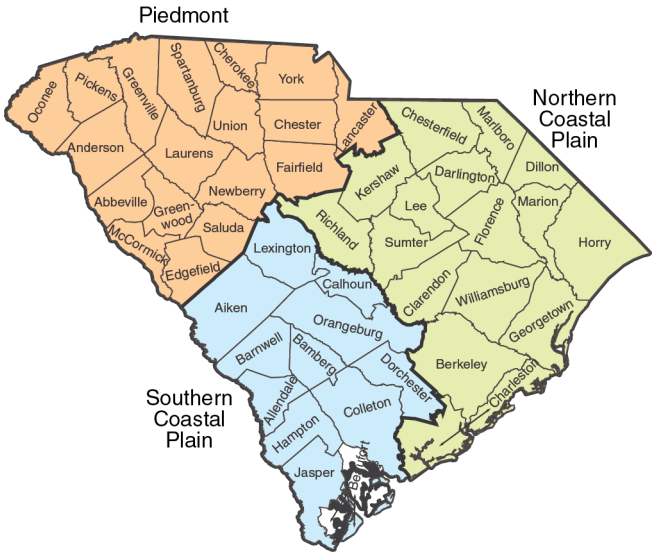

Figure 1—Forest survey units in South Carolina.

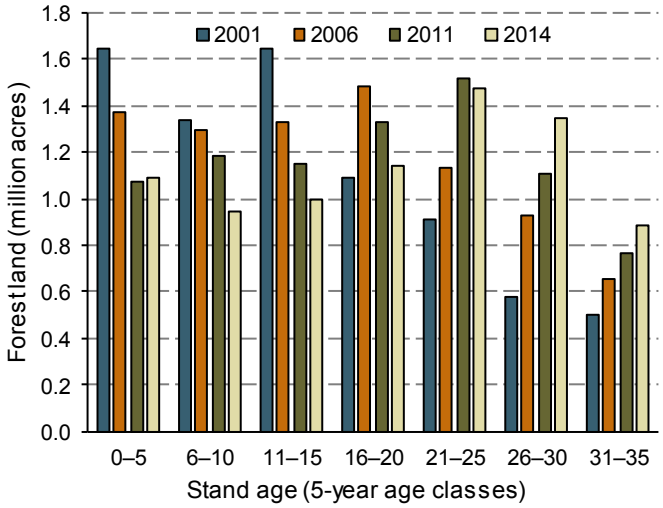

Figure 2—Area of forest land (for stands <36 years old) by stand age and survey year, South Carolina.

Table 2—Area of forest land by survey unit and year, South Carolina

Survey unit	2006	2011	2014	Change since 2011
	thousand acres			*percent*
Southern Coastal Plain	3,426.6	3,502.0	3,481.6	-0.58
Northern Coastal Plain	4,936.9	4,955.7	4,905.7	-1.01
Piedmont	4,684.0	4,662.8	4,586.8	-1.63
Total	13,047.6	13,120.5	12,974.1	-1.12

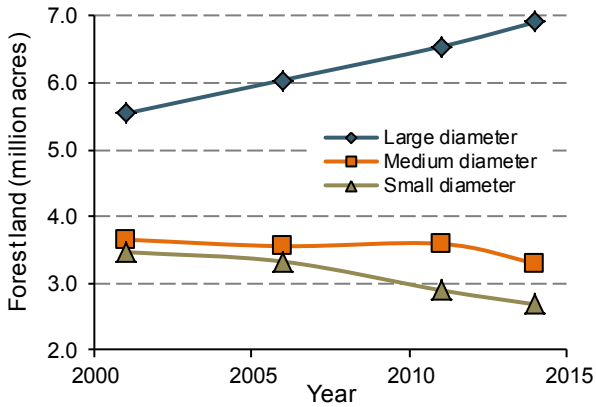

Figure 3—Area of forest land by year and stand-size class, South Carolina.

Volume, Biomass, and Trends

Volume of all-live trees ≥5.0 inches diameter at breast height (d.b.h.) on forest land in 2014 totaled 25.5 billion cubic feet (table 1), the most ever recorded in the State. This volume was split nearly evenly between softwoods and hardwoods and represents an increase of 5.6 percent since 2011. This continues a trend that extends back several decades in South Carolina. With few exceptions, volume increased in all diameter classes for both softwoods and hardwoods (figs. 4 and 5). Much more volume for softwoods is concentrated in smaller trees compared to hardwoods. This is primarily a reflection of many softwood trees in young plantations compared to hardwood trees in older stands.

Loblolly pine, sweetgum, and yellow-poplar were the most voluminous species. Between 2011 and 2014, volume of loblolly pine increased by 8.8 percent, volume of sweetgum increased by 5.1 percent, and that of yellow-poplar increased by 3.3 percent.

South Carolina had 624.7 million dry tons of live-tree biomass on forest land across the State (table 1). This was an increase of 4.5 percent since 2011. This change mirrored the increase in volume, which was up by 5.6 percent.

Overall, net growth of live trees remained stable at 1.3 billion cubic feet per year (table 3). Growth of softwoods, which increased in all three units, accounted for 74 percent of all growth. In contrast, growth of hardwoods decreased in all three units between 2011 and 2014. Removals declined by 0.9 percent across the State, but actually increased in two of three units. Softwood removals accounted for 79 percent of the total. Mortality was up in all units, but was still less than the 2006 survey, when it averaged 198.1 million cubic feet per year. Hardwoods accounted for about 58 percent of the mortality volume, and hardwood mortality increased in all survey units.

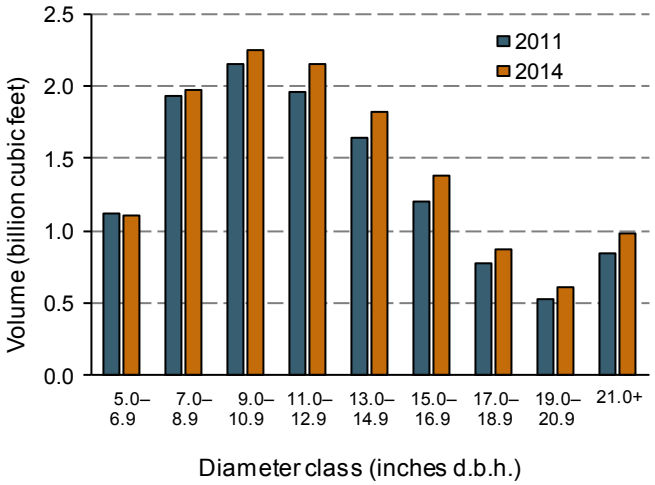

Figure 4—Volume of live softwood trees on forest land by diameter class and survey year, South Carolina.

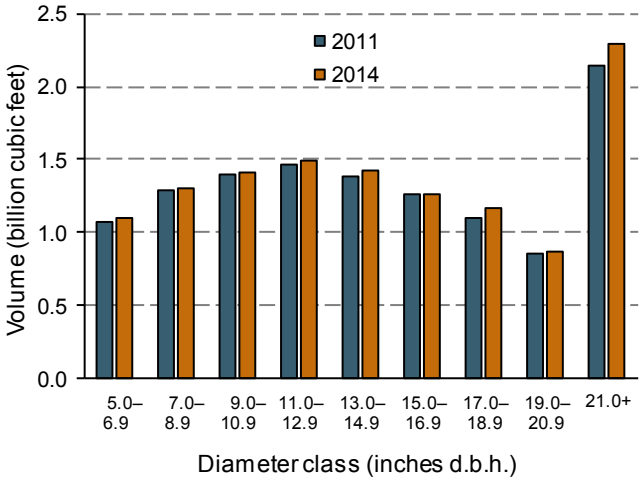

Figure 5—Volume of live hardwood trees on forest land by diameter class and survey year, South Carolina.

Table 3—Average annual net growth, removals, and mortality of live trees on forest land by survey year, survey unit, and major species group, South Carolina

	Total			Softwoods			Hardwoods		
Survey year and unit	Growth	Removals	Mortality	Growth	Removals	Mortality	Growth	Removals	Mortality
	million cubic feet per year								
2011									
Southern Coastal Plain	362.7	232.6	47.3	277.4	190.1	20.1	85.3	42.5	27.1
Northern Coastal Plain	510.7	363.2	52.7	360.0	258.2	22.8	150.7	105.0	29.9
Piedmont	416.1	238.1	71.3	268.4	172.7	37.9	147.7	65.4	33.4
All units	1,289.5	834.0	171.3	905.9	621.0	80.9	383.7	213.0	90.4
2014									
Southern Coastal Plain	367.5	260.8	53.2	287.6	213.0	22.4	79.9	47.8	30.8
Northern Coastal Plain	514.9	294.4	58.9	381.1	233.9	19.8	133.8	60.5	39.2
Piedmont	414.0	271.4	81.0	285.1	203.1	39.9	128.9	68.3	41.0
All units	1,296.4	826.6	193.1	953.9	650.0	82.1	342.6	176.6	111.1

Harvest Removals in South Carolina

Harvest removals (see caption for fig. 6) accounted for 97 percent of all removals [800.6 million cubic feet per year (table 4) versus 826.6 million cubic feet per year (table 3)]. Public lands accounted for 5 percent of harvest removals while private land accounted for 95 percent (table 4). Between 2011 and 2014, harvest removals on private land fell by 32.6 million cubic feet per year, but increased on public land by 15.3 million cubic feet per year 2014.

Loblolly pine accounted for 73 percent of all harvest removals, and about 4 percent of that came from public lands (table 5). Interestingly, a little over half of the total harvest removals of longleaf pine came from public land and accounted for nearly 20 percent of the harvest removals that took place on public land.

Figure 6—Harvest removals refers to trees that were alive at the time of the previous inventory and were either cut and removed by direct human activity related to harvesting or died as a result of these activities. (photo by David Stephens, Bugwood.org).

Table 4—Average annual harvest removals by survey year, species group, and ownership group, South Carolina

Survey year and species group	Total	Ownership group	
		Public	Private
	million cubic feet per year		
2011			
Softwoods	616.1	17.3	598.9
Hardwoods	201.3	4.5	196.8
Total	817.9	22.2	795.7
2014			
Softwoods	643.9	33.3	610.6
Hardwoods	156.7	4.2	152.5
Total	800.6	37.5	763.1

Table 5—Average annual harvest removals by species and ownership group, South Carolina, 2014

Species	Total	Ownership group	
		Public	Private
	million cubic feet per year		
Loblolly pine	584.7	23.7	561.0
Sweetgum	40.8	0.6	40.2
Swamp tupelo	19.5	0.0	19.5
Water oak	15.0	0.1	14.9
Longleaf pine	13.9	7.2	6.7
Red maple	13.8	0.0	13.7
Yellow-poplar	12.0	0.7	11.3
Virginia pine	11.6	0.8	10.8
Slash pine	10.8	1.0	9.7
Shortleaf pine	9.3	0.2	9.1
Total top 10 species	731.3	34.3	697.0
Remaining species	69.3	3.2	66.1
Total	800.6	37.5	763.1

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